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| 09/577,932      | 05/25/2000  | Shigeyuki Maruyama   | 000663              | 4823             |

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/577,932

Applicant(s)

MARUYAMA ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 5 and 13 - 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 5 and 13 - 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 13, 2003 has been entered. An action on the RCE follows.

2. Applicant's amendment filed on January 22, 2003 has been received and entered in the case.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 13 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

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In claim 13, the specification fails to disclose the following phrase “each barometrically independent from another.” The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the term “barometrically” does not have clear support or antecedent basis in the specification or drawings.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 4 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Beddingfield.

Regarding claim 4, Beddingfield discloses in Figs. 2 ~ 8 a semiconductor device comprising:

- a semiconductor element (100) having a plurality of electrodes (102);
- a redistribution layer (103) which connects the electrodes (102) of the semiconductor device to a plurality of electrode pads (108 and 72) each with a first shape and a first size located in predetermined positions of the redistribution layer; and
- at least one mark member (110 and 74) with a second shape and a second size which serves as an alignment mark located in a predetermined positional relationship with the electrode pads,
- wherein the mark member is made of the same material with the electrode pads; and

- wherein the first shape and the first size are correspondingly different from the second shape and the second size.

Regarding claim 5, Beddingfield discloses in Figs. 2 ~ 8 the alignment mark having an outer configuration other than a circle.

7. Claim 13 is rejected under 35 U.S.C. 102(e) as being anticipated by Ishikawa et al.

Regrading claim 13, Ishikawa et al. discloses in Fig. 3 and column 5, lines 54 ~ 57 an apparatus for fixing a semiconductor wafer (26) by suction, comprising:

- a vacuum chuck table (70) having a porous plate overlaying a plurality of concentric suction grooves (78 A ~ 78D);
- a plurality of suction passages (80A ~ 80D) each being connected to the plurality of concentric suction grooves each barometrically independent form another (see Fig. 3 and Fig. 4); and
- suctioning device (84) for sequentially introducing a suctioning force into the suction passages at different timing.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 ~ 3, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beddingfield in view of Ho.

Regarding claim 1, Beddingfield discloses in Figs. 2 ~ 8 a semiconductor device comprising:

- a semiconductor element (100 and 32) having a plurality of electrodes (102 in Fig. 7 and 39 in Fig. 2);
- a plurality of metal posts (108 and 72) each with a first shape and a first size formed on the electrode pads (104) of a redistribution layer (103), the metal posts being configured to be provided with external connection electrodes (41); and
- at least one mark member (110 and 74) with a second shape and a second size which serves as an alignment mark located in a predetermined positional relationship with the metal posts,
- wherein the mark member is made of the same material as the metal posts; and
- wherein the first shape and the first size are correspondingly different from the second shape and the second size.

Beddingfield does not disclose a redistribution layer having a plurality of electrode pads and conductive patterns connecting the electrodes of the semiconductor element to the respective electrode pads. However, Ho discloses in Fig. 2 a redistribution layer (12) having a plurality of electrode pads (31) and conductive patterns (15) connecting the electrodes of the semiconductor element (11) to the respective electrode pads. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Beddingfield by

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using the redistribution layer as taught by Ho. The ordinary artisan would have been motivated to modify Beddingfield in the manner described above for at least the purpose of handling both ends of the wire-width spectrum (column 1, lines 29 ~ 30).

Regarding claim 2, Beddingfield discloses in Figs. 2 ~ 8 the alignment mark having an outer configuration other than a circle.

Regarding claim 3, Beddingfield discloses in Figs. 2 ~ 8 a width of the alignment mark measured along a plane parallel to a surface of the redistribution layer being greater than a height of the metal posts.

Regarding claim 14, Beddingfield discloses in Figs. 2 ~ 8 a semiconductor device comprising:

- a semiconductor element (100 and 32) having a plurality of electrodes (102 in Fig. 7 and 39 in Fig. 2);
- a plurality of metal posts (108 and 72) with a first shape and a first size formed on the electrode pads (104) of the redistribution layer (103), the metal posts being configured to be provided with external connection electrodes (41); and
- at least one mark member (110 and 74) with a second shape and a second size which serves as an alignment mark located in a predetermined positional relationship with the metal posts;
- wherein the first shape and the first size are correspondingly different from the second shape and the second size.

Beddingfield does not disclose a redistribution layer having a plurality of electrode pads and conductive patterns connecting the electrodes of the semiconductor element to the respective

electrode pads. However, Ho discloses in Fig. 2 a redistribution layer (12) having a plurality of electrode pads (31) and conductive patterns (15) connecting the electrodes of the semiconductor element (11) to the respective electrode pads. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Beddingfield by using the redistribution layer as taught by Ho. The ordinary artisan would have been motivated to modify Beddingfield in the manner described above for at least the purpose of handling both ends of the wire-width spectrum (column 1, lines 29 ~ 30).

Regarding claim 15, Beddingfield discloses in Figs. 2 ~ 8 a semiconductor device comprising:

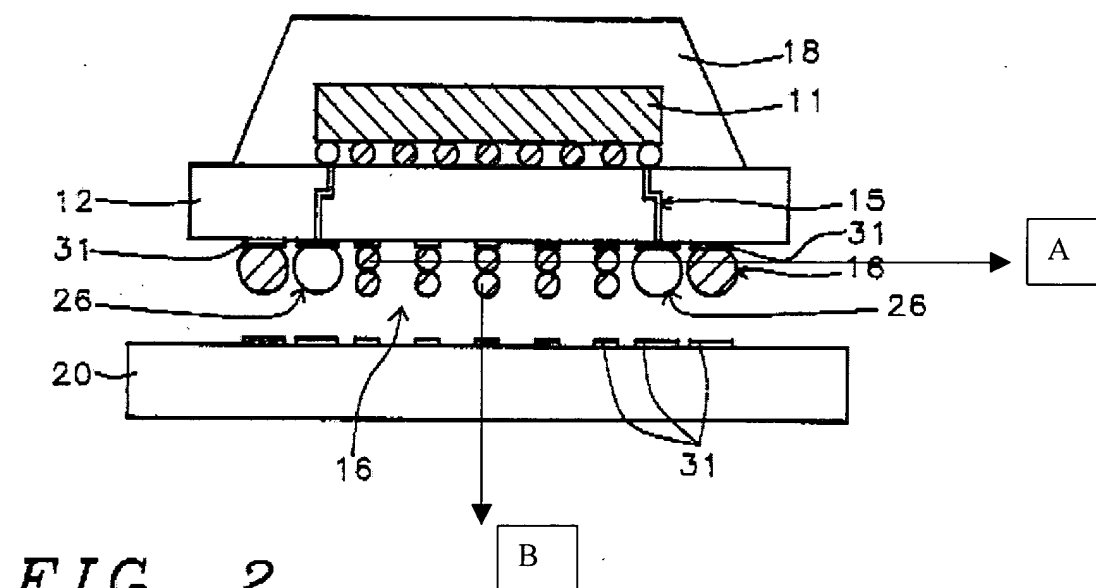
- a semiconductor element (100 and 32) having a plurality of electrodes (102 in Fig. 7 and 39 in Fig. 2);
- a plurality of metal posts (36, 108 and 72) formed on the electrode pads (104) of the redistribution layer (103); and
- at least one mark member (110 and 74) which serves as an alignment mark located in a predetermined positional relationship with the electrode part, the mark member comprising one of the metal posts but lacking the protruding electrode.

Beddingfield does not disclose a redistribution layer having a plurality of electrode pads and conductive patterns connecting the electrodes of the semiconductor element to the respective electrode pads and at least one electrode part comprising one of the metal posts and a protruding electrode attached to a top of the one of the metal posts. However, Ho discloses in Fig. 2 a redistribution layer (12) having a plurality of electrode pads (31) and conductive patterns (15) connecting the electrodes of the semiconductor element (11) to the respective electrode pads and



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at least one electrode part (A and B) comprising one of the metal posts (A) and a protruding electrode (B) attached to a top of the one of the metal posts. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Beddingfield by using the redistribution layer as taught by Ho. The ordinary artisan would have been motivated to modify Beddingfield in the manner described above for at least the purpose of handling both ends of the wire-width spectrum (column 1, lines 29 ~ 30).



**FIG. 2**

### *Response to Arguments*

10. Applicant's arguments filed on January 22, 2003 have been fully considered but they are not persuasive.

On page 7, applicant states "claim 13 ... is supported by way of an example in Figure 32A, where there is indeed shown an apparatus for fixing a semiconductor wafer ... a plurality of

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suction passages each being connected to the plurality of concentric suction grooves 92a each barometrically independent from another.” This statement is not persuasive. Figure 32A or the specification of instant invention does not show the plurality of concentric suction grooves 92a to be each barometrically independent from another. That is, this limitation defines each of the suction grooves to be barometrically independent, i.e. different pressure, when a vacuum is applied to each of the grooves. However, none of the drawings or specification discloses this to be the case. At most two grooves are barometrically independent if vacuum is applied to one but not the other. The purpose of examining claim 13, the terms “barometrically independent” from one another will be understood to mean just that consistent with the originally filed specification.

### *Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
May 2, 2003

A handwritten signature in black ink, appearing to read 'Eddie Lee', with a large, stylized initial 'E'.

**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**